INTERNATIONAL STANDARD

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AMENDMENT 1
2010-06-01

Personal flotation devices —

Part 5: Buoyancy aids (level 50) — Safety requirements

AMENDMENT 1

Équipements individuels de flottabilité —

Partie 5: Aides à la flottabilité (niveau 50) — Exigences de sécurité

AMENDEMENT 1

Reference number
ISO 12402-5:2006/Amd.1:2010(E)

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

Amendment 1 to ISO 12402-5:2006 was prepared by Technical Committee ISO/TC 188, *Small craft*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 162, *Protective clothing including hand and arm protection and lifejackets*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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Personal flotation devices —

Part 5:
Buoyancy aids (level 50) — Safety requirements

AMENDMENT 1

Page 1, Clause 2

Replace “ISO 12402-7:—[1)]” with “ISO 12402-7:2006” and delete footnote 1) at the bottom of the page.

Page 4, 5.1

In the first paragraph, delete the second sentence:

“The temperature cycling test and the rotating shock bin test shall be considered as reliability against wear and tear and shall be conducted prior to the appropriate physical properties test.”

Replace the second paragraph with the following:

“Materials and components used for buoyancy aid shall comply with ISO 12402-7 with the exception of ISO 12402-7:2006, 4.1.6.4.”

In the third paragraph, replace the first and second sentences with the following:

“An inflatable buoyancy aid complying with this part of ISO 12402 shall have automatic or manual inflation that allows for full compliance with all performance requirements of this part of ISO 12402. Additionally, each chamber of the inflatable buoyancy aid shall have oral inflation.”

In the third paragraph, last sentence, replace “ISO 12402-7:—[3)]” with “ISO 12402-7:2006” and delete footnote 3) at the bottom of the page.

Page 5, Table 1

In the fifth row (retroreflective material), replace “M” with “O”.

Page 6, 5.3.2.2

Add the following sentence at the end of 5.3.2.2:

“The time from immersion until initiation of inflation in automatic mode shall not exceed 5 s.”

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Page 6, 5.3.3

Replace subclauses 5.3.3.1 and 5.3.3.2 with the following:

"**5.3.3.1** Any inherently buoyant material used to provide buoyancy shall be capable of withstanding compression and movement in normal wear without sustaining permanent loss of buoyancy."

"**5.3.3.2** Any inherently buoyant material shall prove to have properties in accordance with ISO 12402-7:2006, 4.8."

Delete footnote 4) from the bottom of the page.

Page 6, Table 2

Replace Table 2 with the following:

"**Table 2 — Minimum buoyancy**

User					
Parameter	**Child**	**Adult**			
User's mass, m (kg)	$25 < m \leqslant 40$	$40 < m \leqslant 50$	$50 < m \leqslant 60$	$60 < m \leqslant 70$	$70 < m$
Minimum buoyancy (N)	35	40	40	45	50

"

Page 7, 5.4.2

Replace the first paragraph with the following:

"If required for water-rescue, there shall be affixed to the surface of the buoyancy aid at least 100 cm^2 area of material which is retroreflective of light and conforms to the specification in IMO Resolution A.658(16), Annex 2."

Page 7, 5.5

Add the following at the end of 5.5:

"The load shall be maintained for 5 min, if not specified otherwise."

Page 8, 5.6.2.3

In the third sentence, replace "lifejacket" with "buoyancy aid".

Page 10, 6.2

In the third paragraph (i.e. paragraph after list item v) and NOTE), replace the second sentence with the following:

"The label shall not shrink more than 10 % after washing."

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ICS 13.340.70

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INTERNATIONAL STANDARD ISO 12402-5:2006
TECHNICAL CORRIGENDUM 1

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Personal flotation devices —

Part 5:
Buoyancy aids (level 50) — Safety requirements

TECHNICAL CORRIGENDUM 1

Équipements individuels de flottabilité —

Partie 5: Aides à la flottabilité (niveau 50) — Exigences de sécurité

RECTIFICATIF TECHNIQUE 1

Technical Corrigendum 1 to ISO 12402-5:2006 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 162, *Protective clothing including hand and arm protection and lifejackets*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Page 1

Add the following sentence at the end of Clause 1:

"This part of ISO 12402 is not applicable to one-piece suits."

ICS 13.340.70 **Ref. No. ISO 12402-5:2006/Cor.1:2006(E)**

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Foreword

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ISO 12402-5 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 162, *Protective clothing including hand and arm protection and lifejackets*, in collaboration with Technical Committee ISO/TC 188, *Small craft*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

ISO 12402 consists of the following parts, under the general title *Personal flotation devices*:

— *Part 1: Lifejackets for seagoing ships — Safety requirements*

— *Part 2: Lifejackets, performance level 275 — Safety requirements*

— *Part 3: Lifejackets, performance level 150 — Safety requirements*

— *Part 4: Lifejackets, performance level 100 — Safety requirements*

— *Part 5: Buoyancy aids (level 50) — Safety requirements*

— *Part 6: Special purpose lifejackets and buoyancy aids — Safety requirements and additional test methods*

— *Part 7: Materials and components — Safety requirements and test methods*

— *Part 8: Accessories — Safety requirements and test methods*

— *Part 9: Test methods*

— *Part 10: Selection and application of personal flotation devices and other relevant devices*

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Introduction

ISO 12402 has been prepared to give guidance on the design and application of personal flotation devices (hereafter referred to as PFDs) for persons engaged in activities, whether in relation to their work or their leisure, in or near water. PFDs manufactured, selected, and maintained to this standard should give a reasonable assurance of safety from drowning to a person who is immersed in water.

Requirements for lifejackets on large, commercial seagoing ships are regulated by the International Maritime Organization (IMO) under the International Convention for the Safety of Life at Sea (SOLAS). ISO 12402-1 addresses lifejackets for seagoing ships.

ISO 12402 allows for the buoyancy of a PFD to be provided by a wide variety of materials or designs, some of which may require preparation before entering the water (e.g. inflation of chambers by gas from a cylinder or blown in orally). However, PFDs can be divided into the following two main classes:

— those which provide face up in-water support to the user regardless of physical conditions (lifejackets), and

— those which require the user to make swimming and other postural movements to position the user with the face out of the water (buoyancy aids).

Within these main two classes there are a number of levels of support, types of buoyancy, activation methods for inflatable devices, and auxiliary items (such as location aids), all of which will affect the user's probability of survival. Within the different types of buoyancy allowed, inflatable PFDs either provide full buoyancy without any user intervention other than arming (i.e. PFDs inflated by a fully automatic method) or require the user to initiate the inflation. Hybrid PFDs always provide some buoyancy but rely on the same methods as inflatable PFDs to achieve full buoyancy. With inherently buoyant PFDs, the user only needs to put the PFD on to achieve the performance of its class.

PFDs that do not require intervention (automatically operating PFDs) are suited to activities where persons are likely to enter the water unexpectedly; whereas PFDs requiring intervention (e.g. manually inflated PFDs) are only suitable for use if the user believes there will be sufficient time to produce full buoyancy, or help is close at hand. In every circumstance, the user should ensure that the operation of the PFD is suited to the specific application. The conformity of a PFD to this part of ISO 12402 does not imply that it is suitable for all circumstances. The relative amount of required inspection and maintenance is another factor of paramount importance in the choice and application of specific PFDs.

ISO 12402 is intended to serve as a guide to manufacturers, purchasers, and users of such safety equipment in ensuring that the equipment provides an effective standard of performance in use. Equally essential is the need for the designer to encourage the wearing of the equipment by making it comfortable and attractive for continuous wear on or near water, rather than for it to be stored in a locker for emergency use. Throwable devices and flotation cushions are not covered by this part of ISO 12402. The primary function of a PFD is to support the user in reasonable safety in the water. Within the two classes, alternative attributes make some PFDs better suited to some circumstances than others or make them easier to use and care for than others. Important alternatives allowed by ISO 12402 are the following:

— to provide higher levels of support (levels 100, 150, or 275) that generally float the user with greater water clearance, enabling the user's efforts to be expended in recovery rather than avoiding waves; or to provide lighter or less bulky PFDs (levels 50 or 100);

— to provide the kinds of flotation (inherently buoyant foam, hybrid, and inflatable) that will accommodate the sometimes conflicting needs of reliability and durability, in-water performance, and continuous wear;

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— to provide automatically operating (inherently buoyant or automatically inflated) PFDs that float users without any intervention on their part, except in initially donning the PFD (and regular inspection and rearming of inflatable types), or to provide user control of the inflatable PFD's buoyancy by manual and oral operation; and

— to assist in detection (location aids) and recovery of the user.

PFDs provide various degrees of buoyancy in garments that are light in weight and only as bulky and restrictive as needed for their intended use. They will need to be secure when worn, in order to provide positive support in the water and to allow the user to swim or actively assist herself/himself or others. The PFD selected shall ensure that the user is supported with the mouth and nose clear of the water under the expected conditions of use and the user's ability to assist.

Under certain conditions (such as rough water and waves), the use of watertight and multilayer clothing, which provide (intentionally or otherwise) additional buoyancy, or the use of equipment with additional weight (such as tool belts) will likely alter the performance of the PFD. Users, owners and employers need to ensure that this is taken into account when selecting a PFD. Similarly, PFDs may not perform as well in extremes of temperature, although fully approved under this part of ISO 12402. PFDs may also be affected by other conditions of use, such as chemical exposure and welding, and may require additional protection to meet the specific requirements of use. If the user intends taking a PFD into such conditions, she/he has to be assured that the PFD will not be adversely affected. This part of ISO 12402 also allows a PFD to be an integral part of a safety harness designed to conform to ISO 12401, or an integral part of a garment with other uses, for example to provide thermal protection during immersion, in which case the complete assembly as used is required to conform to this part of ISO 12402.

In compiling the attributes required of a PFD, consideration has also been given to the potential length of service that the user might expect. Whilst a PFD needs to be of substantial construction and material, its potential length of service often depends on the conditions of use and storage, which are the responsibility of the owner, user and/or employer. Furthermore, whilst the performance tests included are believed to assess relevant aspects of performance in real-life use, they do not accurately simulate all conditions of this. For example, the fact that a device passes the self-righting tests in swimming attire, as described herein, does not guarantee that it will self-right an unconscious user wearing waterproof clothing; neither can it be expected to completely protect the airway of an unconscious person in rough water. Waterproof clothing can trap air and further impede the self-righting action of a lifejacket.

It is essential that owners, users and employers choose those PFDs that meet the correct standards for the circumstances in which they will be used. Manufacturers and those selling PFDs have to make clear to prospective purchasers the product properties, alternative choices and the limitations to normal use, prior to the purchase.

Similarly, those framing legislation regarding the use of these garments should consider carefully which class and performance levels are most appropriate for the foreseeable conditions of use, allowing for the higher risk circumstances. These higher risk circumstances should account for the highest probabilities of occurrence of accidental immersion and the expected consequences in such emergencies. More information on the selection and application is given in ISO 12402-10.

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Personal flotation devices —

Part 5:
Buoyancy aids (level 50) — Safety requirements

1 Scope

This part of ISO 12402 specifies the safety requirements for buoyancy aids with a buoyancy of not less than 50 N used in sheltered waters with help and rescue close at hand under such circumstances where more bulky or buoyant devices can impair the user's activity. It applies to buoyancy aids used by adults or children.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 12402-7:—[1)], *Personal flotation devices — Part 7: Materials and components — Safety requirements and test methods*

ISO 12402-8:2006, *Personal flotation devices — Part 8: Accessories — Safety requirements and test methods*

ISO 12402-9:2006, *Personal flotation devices — Part 9: Test methods*

IMO Resolution A.658 (16), *Use and fitting of retro-reflective materials on life-saving appliances*, International Maritime Organization[2)]

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
personal flotation device
PFD
garment or device which, when correctly worn and used in water, will provide the user with a specific amount of buoyancy which will increase the likelihood of survival

3.2
inherently buoyant material
material which is permanently less dense than water

1) To be published.

2) IMO is an institution with domicile in London issuing regulations which are then published as laws by its Member States.

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3.3
automatically operating PFD
PFD in which buoyancy is provided by permanent means (inherently buoyant material) or by suitable means (gas inflation) effected by a system which automatically activates upon immersion and which, except for the inspection and rearming of inflatable types, when correctly donned requires no further action by the user

3.4
automatically inflating PFD
PFD in which inflation is effected as a result of immersion without the user carrying out any action at the time of immersion

3.5
manually inflated PFD
PFD in which inflation is effected as a result of the user operating a mechanism

3.6
orally inflated PFD
PFD inflated by mouth to produce buoyancy

3.7
PFD with secondary donning
PFD for which additional donning or adjustment is needed to place the PFD in its functioning position from the position it is normally worn

NOTE Pouch-type devices are examples of the type of PFDs which usually require such additional positioning.

3.8
vest-type PFD
PFD covering the upper trunk of the user like a vest

3.9
yoke-type PFD
PFD in a style worn around the back of the neck and secured by a waist strap

3.10
emergency light
device which emits light so as to increase the chances of a user being located

3.11
multi-chamber buoyancy system
system that divides the buoyancy provided by an inflatable lifejacket into two or more separate compartments, such that if mechanical damage occurs to one, others can still operate and provide buoyancy so as to aid the user when immersed

3.12
deck safety harness and safety line
device that allows a user to be securely attached to a strong point on a vessel or on shore, so as to prevent him from falling into the water, or, if he does fall into the water, to prevent him from being separated from the vessel or shore

3.13
buddy line
length of cord which can be tied or otherwise fixed to another person or to that person's PFD or other objects, so as to keep a user in the vicinity of that person or object with a view to making location and thus rescue easier

3.14
lifting loop
device which facilitates manual recovery of a person from water

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3.15
sprayhood
cover brought or placed in front of the airways of a user in order to reduce or eliminate the splashing of water from waves or the like onto the airways and thereby to promote the survival of the user in rough water conditions

3.16
protective cover
cover that is normally in place over the functional elements of a PFD in order to protect them from physical damage, or snagging on external objects

NOTE 1 The protective cover may be designed to provide additional properties, i.e. to make the PFDs suitable for use when the subject is exposed to additional hazards, e.g. significant abrasion, molten metal splash, flame and fire.

NOTE 2 The inflatable chamber of an inflatable PFD is an example of a functional element.

3.17
overpressure relief valve
valve which may be used in an inflatable system to avoid the likelihood of destruction caused by overpressure

3.18
whistle
device which, when blown by mouth, produces an audible sound which can aid in the location of the user

3.19
hybrid-type PFD
PFD of combined buoyancy types, i.e. inherent and inflatable

4 Classification

4.1 Classes

4.1.1 Lifejackets

These devices provide face-up flotation with levels of support sufficient for various open and rough water uses. Lifejackets have a buoyancy distribution sufficient to turn most users, when tested on users wearing swimming costumes according to ISO 12402, to a position where the mouth has a defined freeboard above the water's surface, even when the user is unconscious.

4.1.2 Buoyancy aids

These devices should be comfortable for continuous wear and provide lift, without significant face-up turning ability, to float the conscious user with the level of support marked on the device. Buoyancy aids shall at least be suitable for sheltered waters, but at higher performance levels may be suitable for some users in other waters.

4.1.3 Special purpose lifejackets and buoyancy aids

These devices perform as in 4.1.1 and 4.1.2 with different levels of support, but have modifications related to special applications for use. These applications shall not relate to essential requirements such as in-water performance, stability and safety in use. The specific conditions for use shall be stated on their label to maintain essential requirements.

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4.2 Performance levels

4.2.1 Level 275

This level is intended primarily for offshore use under extreme conditions. It is also of value to those who are wearing clothing which traps air and which may adversely affect the self-righting capacity of the lifejacket. It is designed to ensure that the user is floating in the correct position with his mouth and nose clear of the surface.

See ISO 12402-2.

4.2.2 Level 150

This level is intended for general application or for use with foul weather clothing. It will turn an unconscious person into a safe position and requires no subsequent action by the user to maintain this position.

See ISO 12402-3.

4.2.3 Level 100

This level is intended for those who may have to wait for rescue, but are likely to do so in sheltered water. The device should not be used in rough conditions.

See ISO 12402-4.

4.2.4 Level 50

This level is intended for use by those who are competent swimmers and who are near to bank or shore, or who have help and a means of rescue close at hand. These garments have minimal bulk, but they are of limited use in disturbed water, and cannot be expected to keep the user safe for a long period of time. They do not have sufficient buoyancy to protect people who are unable to help themselves. They require active participation by the user.

See this part of ISO 12402.

5 Requirements

5.1 General

A buoyancy aid shall meet the requirements specified in Clause 5 when tested in accordance with ISO 12402-9. The temperature cycling test and the rotating shock bin test shall be considered as reliability against wear and tear and shall be conducted prior to the appropriate physical properties test.

Materials and components used for a buoyancy aid shall comply with ISO 12402-7.

An inflatable buoyancy aid complying with this part of ISO 12402 shall have automatic, manual and oral inflation that allows for full compliance with all performance requirements of this part of ISO 12402. Each chamber of the inflatable buoyancy aid shall have at least manual and oral inflation. The inflatable buoyancy aid shall meet the performance requirements of this part of ISO 12402 with any one chamber deflated. Inflatable buoyancy aids shall be tested against inadvertent inflation according to ISO 12402-7:—[3)], 4.11 and ISO 12402-9:2006, 5.5.11.

3) To be published.

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5.2 Combination of buoyancy aids and accessories

5.2.1 General

Accessories used on buoyancy aids shall comply with ISO 12402-8 as specified in Table 1.

A combination of a buoyancy aid and accessories shall not impair the performance of either item. This shall be proved during the test required for the buoyancy aid as well as accessories. If necessary the test sequence has to be arranged accordingly. Requirements and test methods for accessories are specified in ISO 12402-8.

Table 1 — Accessories for buoyancy aids

Accessory	Mandatory (M) / Optional (O)
Emergency light	O
Whistle	O
Lifting loop	O
Buddy line	O
Retroreflective material	M
Deck safety harness	O
Overpressure relief valve	O
Multi-chamber system	O
Protective covers	O
Sprayhood	O

Buoyancy aids can be equipped with further accessories. Such accessories shall comply at least with ISO 12402-8.

5.2.2 Lifting loop

If a buoyancy aid is provided with a lifting loop, it shall be tested according to ISO 12402-9:2006, 5.5.1.4.

The lifting loop shall be affixed to the buoyancy aid in front of the chest anterior to two lines, each axial to the midline between the lower end of the sternum and the umbilicus and no more than 100 mm to the side of the midline.

The minimum length of the loop shall be 150 mm, measured from attachment to end of the loop.

The lifting loop shall have a minimum width of 20 mm and shall be of a colour distinctive from that of the buoyancy aid.

The lifting loop shall be conspicuous when the user is floating normally.

See also 5.5.

5.2.3 Whistle

The buoyancy aid can be provided with a whistle. The whistle shall comply with ISO 12402-8:2006, 5.2.

5.2.4 Sprayhood

If any form of hood or sprayhood is fitted to cover the face in whole or in part, it shall comply with ISO 12402-8:2006, 5.5 and be marked as specified therein.

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5.3 Types of buoyancy

5.3.1 General

5.3.1.1 The amount of buoyancy shall be such that the in-water performance required by this part of ISO 12402 (freeboard, stable floating position, etc.) is met.

The minimum amount of buoyancy for a buoyancy aid as specified in Table 2 can be provided by inherently buoyant material, chambers inflated by gas or by a combination of the two.

5.3.1.2 If the buoyancy aid is of a hybrid type, it shall provide by its inherent buoyancy alone, the buoyancy required of an equivalently sized device of level 50.

5.3.2 Inflatable buoyancy chambers

5.3.2.1 Inflatable buoyancy chambers shall be capable of withstanding an internal pressure of 70 kPa without damage or permanent deformation when tested in accordance with ISO 12402-9:2006, 5.5.6 at a temperature of − 5 °C and + 30 °C for 2 min.

If a device is operated with an overpressure relief valve, the valve has to be blocked and tested in accordance with ISO 12402-9:2006, 5.5.6 with 40 kPa.

5.3.2.2 Gas-inflated buoyancy aids shall withstand the inflation test in accordance with ISO 12402-9:2006, 5.5.10 before the buoyancy test in accordance with ISO 12402-9:2006, 5.5.9 is performed.

5.3.3 Inherently buoyant material

5.3.3.1 Any inherently buoyant material used to provide buoyancy shall be capable of withstanding compression and movement in normal wear without sustaining permanent loss of buoyancy. The maximum loss of buoyancy when three samples are tested in accordance with ISO 12402-7:—[4], 4.8 and 4.10 shall not exceed 10 % in any foam material providing inherent buoyancy.

5.3.3.2 Any inherently buoyant material shall prove to have a thermal stability in accordance with ISO 12402-7:—[4], 4.8 and 4.10 in which the maximum loss of volume in any sample shall not exceed 5 %.

5.3.4 Total buoyancy provided

5.3.4.1 For the purpose of assessment in accordance with this part of ISO 12402, items of different size are to be accompanied by stated minimum and maximum user's mass, which shall conform to the marked size ranges.

The primary means of indicating the device's size as regards fit shall be one which is appropriate and meaningful to the prospective user, for instance the statement of mass and girth ranges.

5.3.4.2 When tested in accordance with ISO 12402-9:2006, 5.5.9, the minimum buoyancy provided by the different levels shall be as specified in Table 2.

Table 2 — Minimum buoyancy

Parameter	User				
	Child	Adult			
User's mass, m (kg)	$25 < m \leqslant 40$	$40 < m \leqslant 50$	$50 < m \leqslant 60$	$60 < m \leqslant 70$	$m > 70$
Minimum buoyancy (N)	35	40	40	45	50

4) To be published.

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5.3.4.3 If the buoyancy aid is intended for two or more mass categories, the buoyancy shall be at least as specified for the heavier category.

5.3.4.4 The buoyancy of the buoyancy aid shall be tested in accordance with ISO 12402-9:2006, 5.5.9. The difference between the initial measurements and the measurement after 24 h shall not exceed 5 % of the original buoyancy.

The buoyancy measured in any test carried out for the purpose of ascertaining conformity with this part of ISO 12402 shall not be less than that claimed on the marking of the buoyancy aid, nor less than that required in 5.3.4.2.

5.3.4.5 The two buoyancy aids which were subjected to the test in accordance with ISO 12402–9:2006, 5.5.9 shall be used to measure the total buoyancy.

5.4 Conspicuousness

5.4.1 Colour

Buoyancy aids may be of any colour or multiple colours.

5.4.2 Retroreflective material

There shall be affixed to the surface of the buoyancy aid at least 100 cm^2 area of material which is retroreflective of light and conforms to the specification in IMO Resolution A.658(16), Annex 2.

When supporting the user at rest in the water, approximately the same amount of material shall be visible from all directions around and above the buoyancy aid and the material shall be located above water level.

In case of a reversible buoyancy aid, the minimum area and arrangement shall be complied with no matter which way the device is donned.

5.5 Strength

The strength of the device shall be tested in accordance with ISO 12402-9:2006, 5.5.1. No damage shall occur which would result in the buoyancy aid failing to function in accordance with this part of ISO 12402. The means of adjustment shall not have a slippage exceeding 25 mm when subjected to the test.

The horizontal load shall be no less than 2 000 N for adults and children. The vertical load shall be no less than 750 N for adults and children.

The horizontal load value shall also apply, if provided, for the lifting loop tested in accordance with ISO 12402-9:2006, 5.5.1.4.

5.6 Performance

5.6.1 General

5.6.1.1 When worn, the buoyancy aid shall not be unduly bulky, heavy or uncomfortable when tested in accordance with ISO 12402-9:2006, 5.5 and 5.6.

5.6.1.2 The buoyancy aid shall not unduly restrict the vision, hearing, breathing or movement of the user when worn both ashore and in the water and tested in accordance with ISO 12402-9:2006, 5.6. It shall allow easy tightening and loosening of all essential adjustments both ashore and in the water. The buoyancy aid shall not interfere with vision when worn both ashore and in the water and shall allow sufficient comfort, and head and limb movement to preclude it from being removed because of encumbrance or discomfort during emergency use both ashore and in the water.

5.6.1.3 The buoyancy aid shall not contain any component nor use any method of component attachment which in normal use is likely to cause injury to the user or damage the buoyancy aid when tested in accordance with ISO 12402-9:2006, 5.5 and 5.6.

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5.6.1.4 The buoyancy aid shall not significantly hinder dexterity. The user shall be able to swim whilst using the buoyancy aid, climb a ladder, and board a platform when tested in accordance with ISO 12402-9. At least two-thirds of subjects who can accomplish the task specified in ISO 12402-9:2006, 5.6 without the buoyancy aid shall also be able to perform it with the buoyancy aid.

5.6.1.5 The buoyancy aid shall withstand all tested conditions of normal storage and use. The buoyancy aid shall remain serviceable when tested in accordance with ISO 12402-9:2006, 5.5 and 5.6.

5.6.1.6 The buoyancy aid shall not form channels having a tendency to direct water into the face or to the head of the user. The test panel shall witness this by visual inspection during the in-water performance tests.

5.6.1.7 Automatic inflatable buoyancy aids shall be tested against inadvertent inflation in accordance with ISO 12402-9:2006, 5.5.11.

5.6.2 Donning, adjustment and fit

5.6.2.1 The buoyancy aid shall have a proper fit and adjustment. It shall be easy to don. Ties and fastenings necessary for proper performance should be few and simple.

5.6.2.2 Donning shall be obvious and simple on the briefest of instructions. It shall be possible without assistance, except children's buoyancy aids. The ease in donning and discarding the buoyancy aid shall not be unduly affected by adverse conditions in use such as poor light, cold or wet. When tested in accordance with ISO 12402-9, donning by all means of securing the buoyancy aid required to meet the in-water performance requirements shall take no longer than 1 min.

5.6.2.3 When tested in accordance with ISO 12402-9, the means of adjustment within the stated size range shall ensure a secure fit. Security of fit shall not be dependent upon highly elastic material. If crotch straps or other non-elastic devices for improving the security of fit and retention are provided, and it is possible (without physically damaging the buoyancy aid) to wear the lifejacket with and without the straps or devices, the tests in accordance with ISO 12402-9:2006, 5.6.4 and 5.6.5 shall be performed with and without the straps or devices in place.

5.6.2.4 The user shall not slip out of the buoyancy aid when tested in accordance with ISO 12402-9.

5.6.2.5 Manual and oral inflation shall be tested both in and out of water in accordance with ISO 12402-9:2006, 5.6.5 and 5.6.7.

5.6.3 In-water performance

5.6.3.1 A buoyancy aid shall provide lateral and occipital support of the user's body so that the mouth of a relaxed individual is held clear of a still water surface, with the trunk of the body inclined vertical to backwards when tested in conformance with ISO 12402-9:2006, 5.6.

All tests are to be carried out with at least six persons as specified in ISO 12402-9:2006, 5.6 in fresh water under still conditions.

The test subjects have to be good swimmers. They shall wear swimming costumes only. Each test subject has to be made familiar with each of the tests, particularly the requirements regarding relaxing and exhaling in the face-down position. The test subjects have to don the buoyancy aid, unassisted, using only the instructions provided by the manufacturer.

The individual freeboard for each subject measured in accordance with ISO 12402-9:2006, 5.6.2 shall be positive.

5.6.3.2 When the buoyancy aid is in an operational condition, it shall permit the test subject to turn into the position required by 5.6.3.1 within 5 s when tested in accordance with ISO 12402-9:2006, 5.6.

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5.7 Multi-chamber buoyancy systems

Multi-chamber buoyancy systems shall meet the performance requirements of this part of ISO 12402 with any one chamber deflated. Multi-chamber systems shall conform with ISO 12402-8:2006, 5.7.

6 Marking

6.1 General

The buoyancy aid shall be permanently and legibly marked with the information given in 6.2, which shall be given at least in the official language(s) of the country of destination. Information shall be given preferably as pictograms, or as text combined with pictograms, or, if defined pictograms do not exist, as text alone.

6.2 Information on the buoyancy aid

Information on the buoyancy aid shall include the following items:

a) identification of the manufacturer – at least the name of the manufacturer or representative and their mailing address;

b) the class of the PFD and the performance level according to 4.2;

c) the statement that it is not a PFD until fully inflated (only on an inflatable PFD);

d) the size range of the buoyancy aid, e.g. range of chest girth and user's body mass;

e) the minimum buoyancy provided and amount of inflatable buoyancy, if a hybrid type;

f) storage, care, cleaning and maintenance instructions in brief;

g) simple donning and adjustment instructions;

h) simple instructions for use;

i) if inflated by gas, the correct size and charge of the cylinder;

NOTE This information appears near the place where the cylinder is actually fitted.

j) if inflated by gas, a warning that gas cylinders are dangerous goods, and that they shall be kept away from children and not misused;

k) the manufacturer's model, designation, serial number, and quarter (or month) and year of manufacture;

NOTE Months are given as Arabic numerals (1 to 12), and quarters as Roman numerals (I to IV) in order, starting from 1st January.

l) the number of this part of ISO 12402;

m) pictograms or words indicating other risks catered for or not provided for;

n) the text "Do not use as a cushion";

o) the text "Train yourself in the use of the device";

p) the text "Teach the child to float in this buoyancy aid", if intended for children;

q) the text "For children less than 6 years of age use automatically operating devices only", if intended for children;

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r) the range of its specific application;

s) the expected servicing interval assuming average use, and a space for servicing dates to be marked, including additional items (gas bottles, bobbins, retroreflective tapes, etc.) and their replacement;

t) compatibility with safety harnesses, clothing or additional equipment as relevant;

u) the text “Full performance may not be achieved using waterproof clothing or in other circumstances. Refer to the leaflet.”;

v) the text “Warning: Do not apply diapers which provide buoyancy when using the buoyancy aid.”.

NOTE This warning is only required for buoyancy aids for users with a body mass up to 15 kg.

The label bearing this information shall be permanently affixed to the buoyancy aid, shall be resistant to salt water and stand at least 10 washes carried out in accordance with the manufacturer’s instructions. The label shall not shrink so as to affect the appearance or performance of the buoyancy aid or its own legibility.

Special ‘lace up’ pictograms showing the manufacturer’s exact recommendations for webbing (narrow fabric) lacing through the buckle and fastening combination of the ‘cow-tail’ and the text “Practice and training are required with this device before use” shall be placed on the buoyancy aid and in the accompanying information.

7 Information supplied by the manufacturer

The buoyancy aid shall be supplied with an explanatory leaflet containing at least the following items:

a) items given in 6.2;

b) the recommendation that the user should try out the buoyancy aid to ascertain its performance before use;

c) full instructions for donning and use (also instructions for whistle and light if fitted);

d) details of the recommended limitations on use, including sea conditions, temperature limits, life span and any other pertinent information;

e) a description of any spare parts and their replacement, instructions for servicing, maintenance, and packing, if applicable;

f) such other general advice on the care and use of the lifejacket as the manufacturer sees fit.

8 Consumer information at point of sale

8.1 General

A plain text version (see Figures 1 and 2) and/or a pictogram version (see Figure 3) shall be applied for consumer information.

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8.2 Plain text version

The information shall be clearly visible and legible when the device is presented ready for sale, either by ensuring visibility of a marking on the lifejacket itself or by additional labelling on the packaging.

If the presentation of information is divided in various sections, they shall be given in such a way that the consumer can perceive all sections together ("Survey on the entire PFD-system"). The layout of the labels given in Figures 1 and 2 is recommended, whereas the content is mandatory.

If the plain text version is chosen, the information shall be laid out in accordance with Figure 1. The minimum dimension of the information shall be 75 mm × 75 mm. Colours for the text and the label may vary, but shall always contrast with the background.

NOTE 1 Information in row (8), may be given by plain text data or by representing the supplier's logo.

NOTE 2 The label shown in Figure 1 may form the left side of a complete label presenting all stipulated data from the data list (see Figure 2).

The layout of the right part of the label in Figure 2 is optional. For the contents, see data list. The entries in the table are examples.

PERSONAL FLOTATION DEVICE	**ISO 12402-2 to ISO 12402-6**		(1)
Application	Performance level		(2)
Offshore, extreme conditions, special protective clothing, heavy equipment	lifejackets	275	(3)
Offshore, foul weather clothing		150	(4)
Sheltered waters, light clothing		100	(5)
Swimmers only, sheltered waters, help at hand, limited protection against drowning, not a lifejacket	buoyancy aids	50	(6)
Special purpose device	all performance levels		(7)
Manufactured by: ....., ..., ..., ...			(8)
WARNING: FLOTATION DEVICES ONLY REDUCE THE RISK OF DROWNING THEY DO NOT GUARANTEE RESCUE			(9)

Figure 1 — Label specification

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PERSONAL FLOTATION DEVICE		ISO 12402-2 to ISO 12402-6
Application		Performance level
Offshore, extreme conditions, special protective clothing, heavy equipment	lifejackets	275
Offshore, foul weather clothing	lifejackets	150
Sheltered waters, light clothing	lifejackets	100
Swimmers only, sheltered waters, help at hand, limited protection against drowning, not a lifejacket	buoyancy aids	50
Special purpose device		all performance levels
Manufactured by: ....., ..., ..., ...		
WARNING: FLOTATION DEVICES ONLY REDUCE THE RISK OF DROWNING THEY DO NOT GUARANTEE RESCUE		

SPECIAL FEATURES			Integrated emergency light and spray cap					
SPECIAL APPLICATION			Use in extreme climate conditions (–50 °C)					
OPERATION MODE			DESIGN					
Auto-matically operating	Manually operated	Oral inflation only	Multi-chamber system	Amount of inflatable buoyancy (N)	Amount of inherent buoyancy (N)	Integrated harness	Use with harness	
							yes	no
√					70			√

Size	Chest (cm)	Body mass (kg)	Buoyancy for specified body mass (N)	
			Actual value	Nominal value
Medium		70	70	50

Figure 2 — Complete label for consumer information, including additional features and criteria for selection

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8.3 Data list

If the layout of the recommended label is not used, the following details, including all variable data, shall be given in such a way as to inform the consumer coherently about the performance and the size of the buoyancy aid.

a) generic terms;

b) statement of the relevant standard and performance level;

c) any special features;

NOTE Special features are given if the buoyancy aid offers more than the equipment and performance required by the standard, e.g. integrated spray cap, special emergency equipment.

d) any special application;

NOTE Description of special applications, e.g. applicable for sports in white water or fire-fighter tactics or performance under extreme climatic conditions, etc.

e) whether the buoyancy is provided by

— inherent buoyant material,

— gas or air,

— inherent buoyant material and gas or air;

f) whether the buoyancy aid is

— fully automatically operating,

— manually operated,

— only orally inflatable;

g) amount of buoyancy

— in total,

— as parts of inherent and inflatable buoyancy;

h) whether a safety harness

— is integrated in the lifejacket,

— can be worn on the body with the flotation device above;

i) size of the buoyancy aid

— by ticking in the relevant size of a size table,

— by giving the relevant body dimension of the person concerned (body height, chest circumference or body mass or an adequate combination of them), see right side of the label in Figure 2.

NOTE All data shown as contents of the list may be given as shown in Figure 2 or by another format and layout.

If the recommended label as shown in Figure 2 is applied, the presence of data shall be marked and, where relevant, their quantity given by inserting the appropriate figures.

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8.4 Pictograms

The section ‘Application’, rows (2) to (6) of Figure 1 may be replaced by the relevant pictogram shown in Figure 3. The minimum dimensions of these pictograms shall be 50 mm × 50 mm. The remaining contents of rows (1) and (7) to (9) of Figure 1 shall be presented in accordance with 8.3.

The designation of the relevant standard and the meaning of the performance levels may be added under the pictogram for a period of introduction and transition of five years from the publication of the standard. The text shall be identical with the standard wording of rows (3) to (6) in Figure 1.

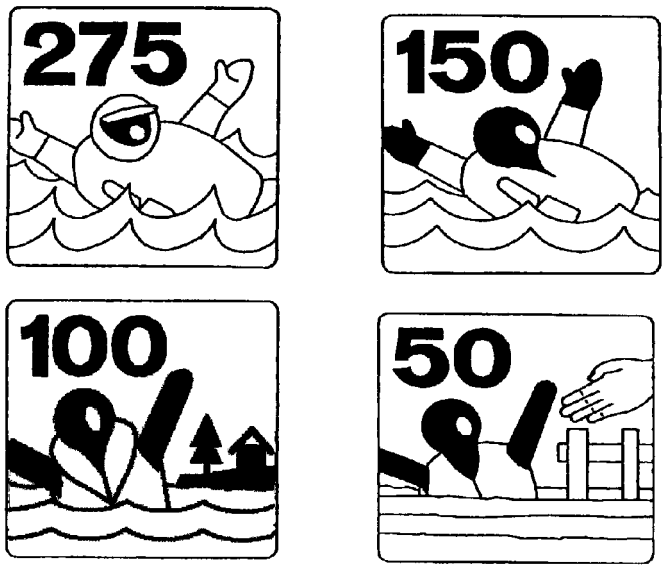

Figure 3 — Pictograms

8.5 Colour-code

The background coloration of rows (3), (4), (5) and (6) of the label specified in Figure 1 and the pictograms are optional. If a colour-code is used the following colours shall be applied:

a) blue for row (3) on the label and for the pictogram ‘275’;

b) turquoise for row (4) on the label and for the pictogram ‘150’;

c) light brown for row (5) on the label and for the pictogram ‘100’;

d) pink for row (6) on the label and for the pictogram ‘50’.

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Bibliography

[1] ISO 12401, *Small craft — Deck safety harness and safety line for use on recreational craft — Safety requirements and test methods*

[2] ISO 12402-1, *Personal flotation devices — Part 1: Lifejackets for seagoing ships — Safety requirements*

[3] ISO 12402-2, *Personal flotation devices — Part 2: Lifejackets, performance level 275 — Safety requirements*

[4] ISO 12402-3, *Personal flotation devices — Part 3: Lifejackets, performance level 150 — Safety requirements*

[5] ISO 12402-4, *Personal flotation devices — Part 4: Lifejackets, performance level 100 — Safety requirements*

[6] ISO 12402-6, *Personal flotation devices — Part 6: Special purpose lifejackets and buoyancy aids — Safety requirements and additional test methods*

[7] ISO 12402-10, *Personal flotation devices — Part 10: Selection and application of personal flotation devices and other relevant devices*

[8] *International Convention for the Safety of Life at Sea (SOLAS)*, 1974, as amended, International Maritime Organization[5)]

5) IMO is an institution with domicile in London issuing regulations which are then published as laws by its Member States.

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